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drops of creosote have been added. Thus the growth of fungi is prevented, which would otherwise mar the appearance of the object very materially.

To mount such bleached specimens, I proceed as follows. Those which have been set aside in creosote water may be, of course, put up permanently in that liquid, but those which have been preserved in spirits, I prefer to mount in creosote. A cell is procured of any suitable substance, as black varnish, gold size, marine glue, or other cement which will withstand the action of water, and a fragment of the Alga being placed in it in the usual manner, water is added, and a fine glass rod or stick of wood just moistened with creosote brought in contact with the liquid. In this way the water becomes sufficiently impregnated with the preservative to insure its antiseptic action. The cover is then put on and cemented down. Thus we have a specimen of the Alga in a transparent condition, all colors which interferes with the observation of many points of structure being removed. In place of creosote water I have made use of camphor water, and found it to answer admirably. The camphor water I make by using distilled water, and just before placing on the cover, putting in a grain of gum camphor, which then remains in the cell, and if near the edge does not mar the appearance of the object in any way. Specimens can also be mounted in the glycerine-jelly of Mr. Lawrence, which preservative I find to be excellent for all kinds of Algæ and vegetable preparations generally; in fact after a little practice, the manipulation of it becomes almost as easy as that of balsam, and air bubbles, those torments of beginners, are the exception and not (as is the case for a long time generally after a tyro begins mounting microscopic objects) the rule. Of the use of this jelly, or rather a modification of it, I shall at some future time have more to say.—ARTHUR MEAD EDWARDS, *New York*.

ANSWERS TO CORRESPONDENTS.

J. T., Tabor, Iowa.—The Land and Fresh-water Shells of the United States, by Binney, Prime and Tryon, published by the Smithsonian Institution, will be the most modern works for reference. Descriptions of Unios, etc., are mostly contained in the writings of Isaac Lea, of Philadelphia. The best way to procure specimens for your college, is to make good collections of your native animals and plants, and then exchange them with other parties. We will announce such desires to exchange free of cost.

E. G., Albion, Wis.—Your specimens considered as *Ophioglossum reticulatum* Fries., does not seem to differ from dwarf and depauperate specimens of *O. vulgatum*, nor do the reticulations differ in any way that I can perceive, on comparison with British or with New England forms. Never having seen either a description or authentic specimens, such as you say were collected by Prof. Kümlein, I have no means of speaking with any certainty. The same style of reticulation occurs in *O. bulbosum* Michaux, a Southern variety; and as the species is very variable, it is probable that *O. reticulatum* is but a local variety, though the botanical authority of Fries is of great moment regarding any plant which comes under his observation.—J. L. R.

B. F. L., Concordville, Pa.—To your query, "How long will spiders live without eating?" we would reply that adult spiders, like adult six-footed insects, will fast for months, though when young and growing they are usually voracious. How your young spiders lived twenty days after hatching without food, we do not understand, though we have observed that the young of the Moose tick lived nearly a month without food after hatching.

The Tarantula is confined to the Southern States, though the Editors of the "American Entomologist" report the occurrence of *Mygale Hentzii* in Missouri. It may possibly occur in Eastern Indiana. Spiders are well known to be cannibals, the females

after their love passages with their partners, frequently falling upon them and devouring them. The "Guide to the Study of Insects" will contain chapters on the *Arachnida* and *Myriapods*, with numerous illustrations.

C. E. R., Roxbury. — The field lies before you at low tide. The best books you can have are those exposed to you by nature. It will be impossible for you to study all until you have mastered some of the leading principles of zoölogy. And the best way to commence is to select some group, among the mollusca for example; collect all the species you can, study them, ascertain all you can regarding their habits. Work patiently from year to year; be sure you have a love for it at every step. If you choose the mollusca, Gould's *Invertebrata* is the best and only guide, a new edition of which will be out soon, in connection with Woodward's *Manual of the Mollusca*. 12mo, London. Should you study the radiates, Agassiz's *Seaside Studies*, published by Ticknor & Fields, is the best for reference. As for the crustacea and worms, their descriptions are scattered through many publications, especially the *Journal*, *Proceedings* and *Memoirs of the Boston Society of Natural History*.

H. G., Detroit, Mich. — The specimens boring the hickory were *Clytus pictus* in the larva, pupa and beetle stage; the other larva also found in the hickory log, seems to be the larva of one of the *Cleridae*. We should be greatly obliged for any specimens of Coleopterous larvæ for the Museum of the Academy, which already has a good collection of the early stages of insects. Will not all our friends, who perhaps do not usually preserve larvæ in their entomological expeditions, send them to us, especially the larvæ of *Carabida*, and those injurious to fruit and forest trees. If possible, put the larvæ, pupæ and beetle together in a vial, with whiskey. Will our Southern friends, as the season opens, remember that we want specimens of the Cotton Ball Worm and Army Worm, in all their stages, including the Moths, which can be sent in folded papers, by mail, though better in stout chip or pasteboard boxes.

R. S., Waverly, N. Y. — In order to reply to your question as to the locality where the stone used by the Indians for making arrowheads was obtained, it will first be necessary to know the exact species of mineral your arrowheads are made of, as several minerals were in common use for the purpose, and many arrowheads, knives, etc., were undoubtedly made from minerals only existing in localities far distant from the spot where the manufactured articles were found. The hornstone (a mottled drab-colored stone), which was in very common use for arrowheads, etc., has generally been supposed to have been taken from Mt. Kinco, on Moosehead Lake, in Maine, but that it also occurs in other places, is evident from the fact that Prof. Wyman has in his cabinet a stone which he picked up at a gravel bank in Cambridge, identical with the mineral from Mt. Kinco. Several characteristic varieties of jasper occur in Lynn and Saugus, and were much used for arrowheads, etc. Dr. True has a short paper in the *Proceedings of the Portland Society of Natural History*, Vol. I, p. 165, on this subject, but sufficient attention has not yet been given to this very interesting subject to enable one to trace the source of all the minerals used. We are receiving specimens of arrowheads, knives, axes, gouges, pottery, etc., etc., from various parts of the country, and hope in time to add our mite to the general stock of information on this subject. We should be pleased to receive any specimens you could obtain for us from your own or other localities, to add to the Academy's collection.

W. E. E., Dorchester, Mass. — The shells from a spring are *Pisidium variable*.

SCIENCE GOSSIP. — Our subscribers (before February 15th) should have received their copies of *Science Gossip* by this time. If not received please informs us, as we have notice from the Editor that they have been mailed. We receive subscriptions for the "Gossip" at any date, and can secure back numbers.

A. S. J., Iowa City. — Lectures on Comparative Anatomy and Physiology of Vertebrate Animals. Part I. FISHES. By Richard Owen. London, 1846. Longman, Brown, Green & Longman.

J. H. B., Richmond, Va. — Lippencott & Co., of Philadelphia, have published an illustrated work on the Birds of North America, by Baird, Cassin & Lawrence. 2 vols., 4to, with one hundred colored plates. Price \$22.50. Atlas sold separate for \$17. Prof. Baird's Report on the Birds of North America (ninth volume of the Pacific Railroad Surveys) is now the standard work on American Ornithology. We can furnish copies of either works. — Cooke's Fern Book, \$1.00.

SEVERAL CORRESPONDENTS have asked questions regarding the use of Carbolic acid as a substitute for alcohol, etc., to which we answer that Carbolic acid in water alone will not preserve animals, but pure Glycerine, with a very small amount of Carbolic acid (say about three or four drops of acid to 2 oz. of Glycerine) answers admirably for some delicate animals. But the best thing for preserving most animals is alcohol. The contraction of animals put into alcohol (complained of by some correspondents) is caused by the alcohol being too strong. All animals should be put into weak alcohol at first (not over twenty-five or thirty per cent.), and after remaining a few hours should be transferred to about seventy-five or eighty per cent. alcohol. A very fine article for preserving the tissues of animals, and for soft animals like mollusks, actinias, worms, insect larvæ, etc., can be made after a few experiments, of Glycerine, a little of the strongest alcohol, and a very small portion of Carbolic acid. This preparation will preserve the colors as well as the tissues. A little fine soap (white castile is the best) put into alcohol will prevent most colors from fading, unless exposed to direct sunlight.